

DEPARTMENT OF THE INTERIOR, CANADA

Hon. ROBT. ROBERTS, Minister: W. W. COY, Deputy Minister.

FORESTRY BRANCH—BULLETIN No. 26

R. H. CAMPBELL, Director of Forestry.

# FOREST PRODUCTS OF CANADA

1910

## PULPWOOD

COMPILED BY

H. R. MACMILLAN, B.S.A., M.F.

ASSISTED BY

BRUCE ROBERTSON AND W. GUY H. BOYCE.

OTTAWA

GOVERNMENT PRINTING BUREAU

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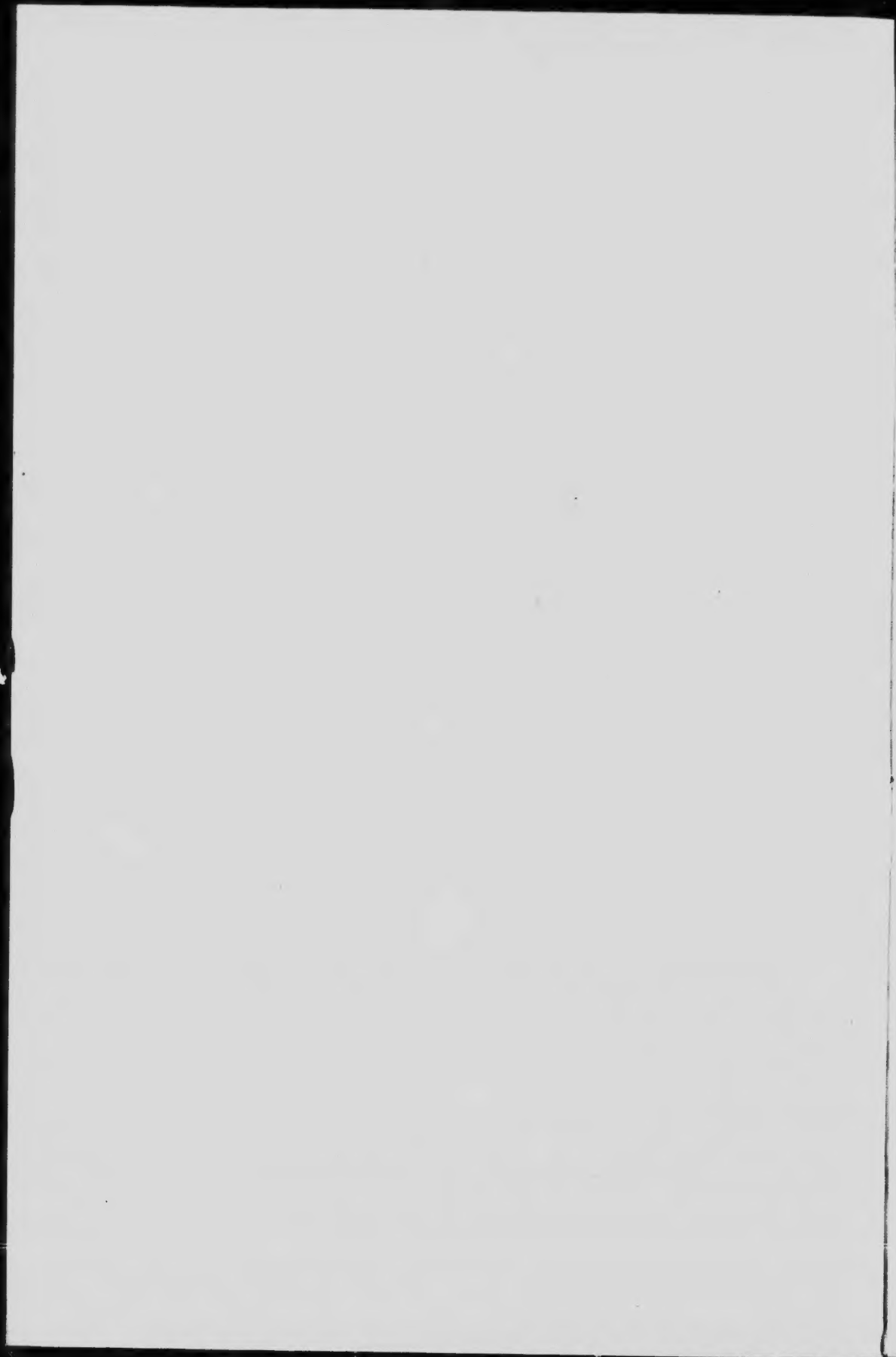
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LETTER OF TRANSMITTAL

FORESTRY BRANCH,

DEPARTMENT OF THE INTERIOR,

OTTAWA, October 7, 1911.

SIR,—I beg to transmit herewith a report of the 'Pulpwood' manufactured in Canada during the calendar year 1910, and also of that exported from the Dominion during the year specified, and to recommend its publication as *Pulletin* No. 26 of this Branch.

The report contains an account of the quantity and value of the pulpwood produced in the Dominion according to the provinces in which it was produced, the species used and the method of manufacture, of the pulp exported from the Dominion and the small quantity imported and of the pulpwood exported from Canada in an unmanufactured state.

I have the honour to be, Sir,

Your obedient servant,

R. H. CAMPBELL,

*Director of Forestry.*

W. W. CORY, C.M.G.,

Deputy Minister of the Interior

Ottawa.



## PULPWOOD CONSUMPTION, 1910.

The figures given for pulpwood consumption refer only to wood manufactured into pulp in Canadian mills, and include only wood of domestic origin. Wood which is exported raw is given in Table 6. There are seventeen mills on the lists of the Forestry Branch from which no returns were received in 1910, but in nearly all cases these firms are newly incorporated or are known to be shut down, either temporarily or permanently. The quantity and value of the pulpwood industry given in the following tables may be considered, therefore, a trustworthy estimate.

The fifty-one mills reporting used, in 1910, 598,487 cords of wood. There were exported in a raw state 943,141 cords, and for the first time pulpwood was imported into Canada to the extent of \$49,322.

Over 95 per cent of Canadian mills cut the pulpwood used by them from their own limits, and consequently cross the wood themselves.

In Table 1 is shown the quantity, total value and average value per cord of pulpwood used and the number of tons of pulp produced in each province for the years 1909 and 1910, also the number of mills operating in 1910.

TABLE 1.

PULPWOOD, 1909 AND 1910, BY PROVINCES: Total Quantity of Wood Used, Total Value, Average Value per Cord, Quantity of Pulp Produced and Number of Firms Reporting, 1910.

| Province.              | 1909.      |           |                         |                    | 1910.      |           |                         |                   |                            |
|------------------------|------------|-----------|-------------------------|--------------------|------------|-----------|-------------------------|-------------------|----------------------------|
|                        | Wood used. | Value.    | Average value per cord. | Pulp Produced (1). | Wood used. | Value.    | Average value per cord. | Pulp Produced (1) | Number of firms reporting. |
|                        | Cords.     | \$        | \$ c.                   | Tons.              | Cords.     | \$        | \$ c.                   | Tons.             |                            |
| Canada .....           | 622,129    | 3,464,080 | 5 57                    | 445,408            | 598,487    | 3,585,154 | 6 00                    | 474,604           | 51                         |
| Quebec .....           | 319,935    | 1,866,700 | 5 83                    | 238,286            | 342,755    | 1,879,831 | 5 48                    | 282,938           | 25                         |
| Ontario .....          | 187,352    | 1,070,740 | 5 72                    | 132,491            | 210,552    | 1,479,538 | 7 02                    | 156,076           | 15                         |
| Nova Scotia .....      | 25,076     | 101,945   | 4 07                    | 23,396             | 29,606     | 135,965   | 4 59                    | 25,955            | 6                          |
| New Brunswick .....    | 88,450     | 414,689   | 4 69                    | 49,901             | 15,134     | 87,620    | 5 79                    | 9,285             | 4                          |
| British Columbia ..... | 1,316      | 10,006    | 7 44                    | 644                | 440        | 2,200     | 5 00                    | 350               | 1                          |

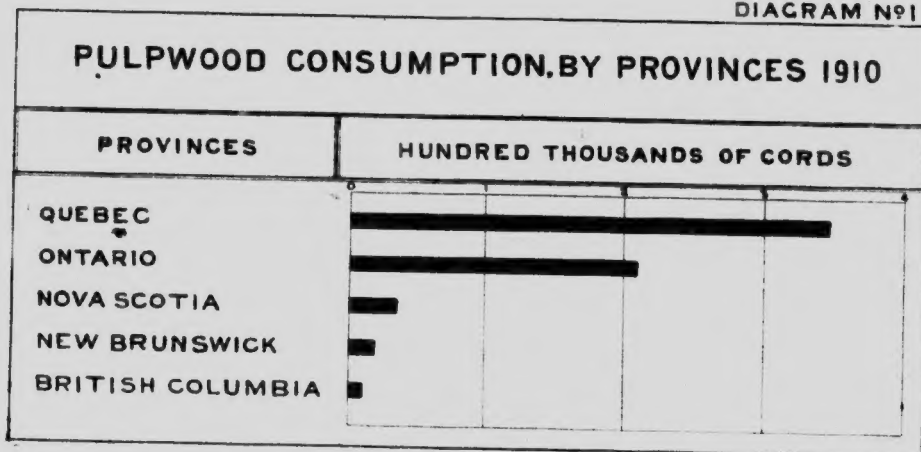
<sup>1</sup> Approximate.

Although 23,642 cords of wood, or 3.8 per cent, less was used in 1910 than the year previous, the average price per cord has increased the value of the pulpwood industry by \$121,077 over its value in 1909. The decrease in the quantity is due to the temporary closing of one or two large mills. This year the price of pulpwood recovered from the decline seen in 1909, when the price was only \$ 57 per cord, and is about the same as in the year previous. The price was \$6.07 in 1908 and in 1910 was

\$6. In 1910, also, 29,196 more tons of pulp were produced than during 1909, owing to an increase this year of some 145 lbs. in the amount of pulp produced per cord of wood.

Quebec is the premier pulpwood province of Canada because of its extensive spruce and balsam fir forests suitable for pulpwood, abundant and cheap water-power and plentiful supply of labor. The twenty five mills in Quebec reported the consumption of 57 per cent of the total for Canada, or 22,820 cords more than in 1909. Ontario likewise increased the amount consumed in its fifteen pulp mills by 23,200 cords, and used over one third of the total consumption. The two provinces just named furnished over 92 per cent of the total quantity of pulp. Nova Scotia consumed nearly 20 per cent more than last year, while New Brunswick used barely one fifth as much as in 1909. Thus Nova Scotia surpasses New Brunswick as a pulpwood province. New Brunswick in 1909 contributed 14.2 per cent of the total; this year it was only 2.2 per cent; this resulted mainly from the closing of one large plant. The province of British Columbia is still experimenting in pulpwood manufacture, and the negligible amount used in this province is for test purposes only.

DIAGRAM No. 1



Quebec is the one province in which the price of pulpwood was less in 1910 than in 1909, the price falling off 35 cents per cord. The increase in the price of pulpwood throughout Canada is largely due to Ontario, in which province pulpwood was worth \$7.02 per cord, or \$1.30 more than during the previous year. Pulpwood was also more expensive this year in Nova Scotia and New Brunswick. Pulpwood from Nova Scotia, at \$4.59 per cord, was cheaper than in any other province.

The quantity, value and per cent distribution of the species used for pulpwood in 1910 is given in Table 2.

# PULPWOOD CONSUMPTION, 1910

7

TABLE 2.

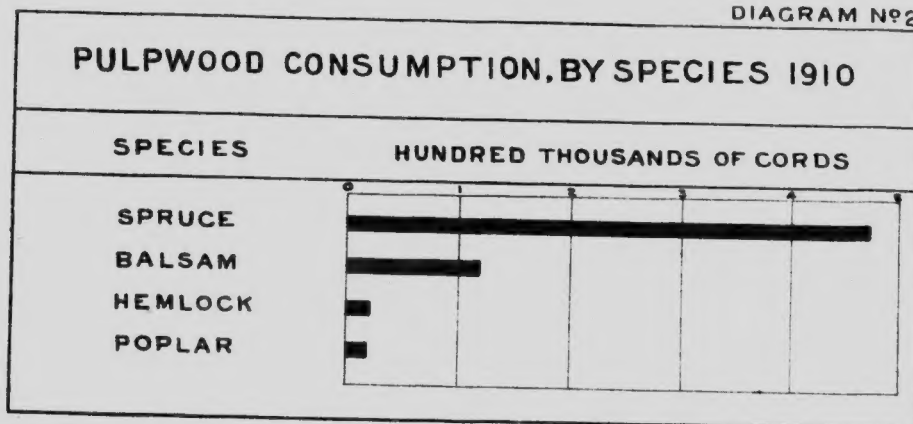
PULPWOOD, 1909 AND 1910, BY SPECIES: Total Quantity, Total Value and Per Cent Distribution.

| Kind of Wood. | 1909.     |           |                        | 1910.     |           |                        |
|---------------|-----------|-----------|------------------------|-----------|-----------|------------------------|
|               | Quantity. | Value.    | Per Cent Distribution. | Quantity. | Value.    | Per Cent Distribution. |
|               | Cords.    | \$        |                        | Cords.    | \$        |                        |
| Total (1)     | 622,129   | 3,464,080 | 100                    | 598,487   | 3,360,154 | 100                    |
| Spruce        | 516,030   | 2,793,318 | 82.9                   | 470,230   | 2,866,678 | 78.6                   |
| Balsam        | 100,095   | 637,065   | 16.1                   | 120,475   | 698,608   | 20.1                   |
| Hemlock       | 700       | 3,156     | 0.1                    | 3,810     | 16,922    | 0.6                    |
| Poplar        | 5,188     | 30,135    | 0.9                    | 3,608     | 21,366    | 0.6                    |

(1) The total contains a small quantity of wood not identified by species.

The decrease in the amount of pulpwood used in 1910 chiefly affected the use of spruce—45,800 cords less of this species being used in 1910 than in 1909. Although still over 75 per cent of the total pulpwood consumption, the proportion is gradually becoming less. In 1908 spruce formed 87 per cent of the total, in 1909, 83 per cent, and in 1910 78.6 per cent. The loss is all seen in New Brunswick, in which province 71,000 cords less of spruce was used this year than in 1909.

DIAGRAM N°2



Balsam fir is a species of wood which is increasing in importance as a pulp-wood. In 1910 twenty per cent, or 20,380 cords, more balsam fir was used than in 1909, and it is steadily gaining for itself a higher position among the important pulpwood species. In 1908 it formed 12 per cent of the total, in 1909, 16 per cent, and in 1910, 20 per cent.

Another species which is gradually but surely becoming more important is hemlock, over five times as much being used in 1910 as during 1909. Hemlock was reported as a pulpwood for the first time in 1909, and this year it was used to a greater extent than poplar, thus becoming the third species in importance among pulpwoods.



The use of poplar fell off one quarter, as only 3,608 cords of this wood were used in 1910. Jack pine has not been reported as a pulpwood since 1908. Before that time it was used considerably by two large mills, but has proven unsatisfactory.

The average price of the different species used is the cost to the mill-owner, and so includes varying logging expenses and a wide difference in transportation charges. A considerable proportion of pulp-mill owners have their own timber limits, and to them the cost of pulp logs is merely the cost of carrying the limit and the transportation charges. Other operators buy in the open market and add transportation charges also.

Thus the prices quoted are the purchase price under different conditions and do not show the relative value of the different woods for pulp manufacture.

The effect of an excessive hauling distance is demonstrated in Ontario, where the price of spruce and balsam fir in 1910 was \$7.01 and \$7.22 respectively. The high price of balsam fir and the increased demand for this species proves its suitability for manufacture into pulpwood. Spruce was the most expensive species at \$6.05, or 64 cents more than in 1909. During 1910 the price of balsam fir fell to the amount of 55 cents, to \$5.71. Hemlock remained at about the same price for the two years and is still the cheapest species. In 1909 it was \$4.51, and in 1910 \$4.43. Poplar has increased 11 cents during the year, the price being \$5.92 during 1910. The cheapest pulpwood bought was a small quantity of poplar in Nova Scotia, which cost \$3 per cord. Balsam fir in Ontario at \$7.22 was the most expensive wood used in Canada for pulping.

During 1910, no slabs or sawmill waste was reported as being converted into wood-pulp. This is an economy practiced in other countries, and by neglecting it Canada is losing greatly. It has been conservatively estimated that if all useful logs left in the bush by lumbermen, large-sized branches, slabs and other mill waste from the lumber industry in Canada had been conserved and converted into pulpwood in 1910, the annual output of pulpwood would have been increased, and not a single acre need have been cut over for logs to make wood-pulp only. During 1909, in the United States, 6 per cent of the total pulpwood consumption was from slabs and mill waste. If economy had been practiced to the same extent in Canada during the year 1910, as much pulp might have been produced without cutting one additional pulp log as is manufactured from 36,000 cords of wood. This is considerably more pulp than Nova Scotia produced during 1910. The sooner such practical economy and utilization of waste commences, the longer will Canada have an adequate supply of pulpwood.

The extent to which different woods are used in different processes in each province is shown in Table 3.

TABLE 3.

PULPWOOD, 1910, BY PROVINCES, SPECIES AND PROCESSES: Quantity of Wood Used.  
TOTAL—ALL PROCESSES.

| Provinces.             | Total.  | Spruce. | Balsam Fir. | Hemlock. | Poplar. | Un-specified. |
|------------------------|---------|---------|-------------|----------|---------|---------------|
|                        | Cords.  | Cords.  | Cords.      | Cords.   | Cords.  | Cords.        |
| Canada .....           | 598,487 | 470,230 | 120,475     | 3,816    | 3,608   | 358           |
| Quebec .....           | 342,755 | 239,824 | 96,474      | 3,616    | 2,483   | 258           |
| Ontario .....          | 210,552 | 189,196 | 20,256      |          | 1,100   |               |
| New Brunswick .....    | 15,134  | 15,134  |             |          |         |               |
| Nova Scotia .....      | 29,606  | 25,636  | 3,745       | 200      | 25      |               |
| British Columbia ..... | 440     | 440     |             |          |         |               |

## MECHANICAL PROCESS.

|                   |         |         |        |     |    |     |
|-------------------|---------|---------|--------|-----|----|-----|
| Canada .....      | 388,561 | 323,350 | 64,377 | 600 | 25 | 200 |
| Quebec .....      | 243,362 | 188,905 | 53,848 | 400 |    | 200 |
| Ontario .....     | 115,593 | 108,809 | 6,784  |     |    |     |
| Nova Scotia ..... | 29,606  | 25,636  | 3,745  | 200 | 25 |     |

## SULPHITE PROCESS.

|                        |         |         |        |  |       |  |
|------------------------|---------|---------|--------|--|-------|--|
| Canada .....           | 192,857 | 134,959 | 56,098 |  | 1,800 |  |
| Ontario .....          | 93,859  | 80,387  | 13,472 |  |       |  |
| Quebec .....           | 86,424  | 41,998  | 42,626 |  | 1,800 |  |
| New Brunswick .....    | 12,134  | 12,134  |        |  |       |  |
| British Columbia ..... | 440     | 440     |        |  |       |  |

## SODA PROCESS.

|                     |        |        |  |       |       |     |
|---------------------|--------|--------|--|-------|-------|-----|
| Canada .....        | 17,069 | 11,921 |  | 3,216 | 1,783 | 149 |
| Quebec .....        | 12,969 | 8,921  |  | 3,216 | 683   | 149 |
| New Brunswick ..... | 3,000  | 3,000  |  |       |       |     |
| Ontario .....       | 1,100  |        |  |       | 1,100 |     |

In Quebec, seven tenths of the wood used was spruce, balsam fir made up 28 per cent, and the remainder consisted of small quantities of hemlock and poplar. Both Quebec and Nova Scotia cut the four species used for pulpwood in Canada. No hemlock was reported from Ontario, in which province 90 per cent of the consumption was spruce and the remainder was balsam fir. Spruce made up four fifths of the consumption in Nova Scotia, balsam being used for practically all the balance. New Brunswick used spruce only.

Nearly four fifths, namely, 78 per cent, of the pulpwood manufactured in Canada in 1910 was manufactured by the mechanical process; the sulphite process produced one fifth, and the remainder (2 per cent) was manufactured by the soda process. Quebec made 63 per cent of the total mechanical pulp in Canada—more than twice as much as did Ontario. Of sulphite pulp, Ontario produced the most, although Quebec was a close second. The latter province manufactured over three quarters of the pulp made by the soda process.

Spruce, as in former years, was the chief wood used in each process. Over two-thirds (68.8 per cent) was used for mechanical pulp; over one-quarter (28.7 per cent) was made into sulphite pulp, and the remaining 2.5 per cent was manufactured by the soda process.

Balsam fir has not yet been used in the soda process and is used to almost the same extent with the two other processes. The mechanical process consumed some 53 per cent of this wood, while 47 per cent was manufactured by the sulphite process. Eighty-four per cent of the hemlock was manufactured by the soda process, which is adapted for most species of wood. One sixth of the hemlock was used to make mechanical pulp.

The physical properties of poplar wood do not adapt it for grinding by the mechanical process, and practically no poplar was manufactured by this process during 1910. It was used in almost equal quantities by the other two classes of manufacturers.

Ontario manufactured a little by the soda process; only ground pulp was made in Nova Scotia; while New Brunswick produced small quantities of both sulphite and soda pulp.

#### MECHANICAL PROCESS.

Pulp manufactured by the mechanical process forms a greater percentage of the total during 1910 than at any time in the past. In the United States the percentage of ground pulp used is decreasing. The cause of the increase this year in Canada is probably due to the interruption of manufacture by the sulphite mills of New Brunswick. Unlimited supply of clean water is a necessity in the manufacture of wood by the mechanical process. A species of wood is also required which has a long loose fibre which will not lose its shape and texture in the grinding. For these reasons Quebec with its spruce and balsam fir tracts and numberless waterfalls is the province best adapted for mechanical pulp manufacture.

Spruce furnished 83.2 per cent of the wood used for mechanical pulp, and balsam fir contributed 16.6 per cent, with small quantities of hemlock and poplar making up the balance.

The average cord of wood reduced by the mechanical process in Canada during 1910 produced 1,908 pounds of pulp. This is 257 pounds more per cord than was produced last year, but such comparisons depend greatly on the relative condition of air-dryness of pulp. Slightly over half this amount of pulp is produced per cord of wood by either the sulphite or soda processes, but the quality of texture is much better. The paper used in the average newspaper of to-day is composed of about twenty-five per cent of sulphite fibre and seventy-five per cent of the ground-wood fibre made by the mechanical process.

#### SULPHITE PROCESS.

In British Columbia, experiments are being carried on with the sulphite process, and, in 1910, 440 cords of spruce were used in the manufacture of paper.

Seventy per cent of the wood used in the sulphite process was spruce, mostly from Ontario. Balsam fir furnished 29 per cent, about three quarters of which was from Quebec, and the same province used 1,800 cords of poplar to make sulphite pulp.

The average production of pulp for every cord of wood used in the sulphite process during 1910 was 997 pounds.

#### SODA PROCESS.

Canada has the distinction of having the oldest soda mill in America, although the process is, at present, not in general use, and is found in only a few small mills. The production by this process, however, will shortly be increased by the completion of a large new mill, for the manufacture of 'Kraft' paper from soda pulp.

The soda process was the principal method used in the reduction of hemlock. Small quantities of spruce and poplar were also used in 1910. Balsam fir, however, is not suited to this process. Of the total, spruce formed 71 per cent; hemlock, 19 per cent, and poplar, 10 per cent.

Quebec manufactured over three quarters of the pulp made by the soda process; 17 per cent of the soda pulp was from New Brunswick, and 1,100 cords of poplar consumed by this method in Ontario made up seven per cent of the total.

The average amount of soda pulp produced per cord was 987 pounds, or 10 pounds less than by the sulphite process.

In Table 4 the information given in the first three tables is collected and presented in tabular form, giving more details.

TABLE 4.

PULPWOOD, 1910, BY PROVINCES, SPECIES AND PROCESSES: Number of Mills, Quantity of Pulpwood Used, Quantity of Pulp Produced, Quantity of Each Species of Wood Used, Quantity Produced by Each Process, Total Cost and Average Cost per Cord.

|                        | Total.    | Quebec.   | Ontario.  | Nova<br>Scotia. | New<br>Brunswick | British<br>Columbia. |
|------------------------|-----------|-----------|-----------|-----------------|------------------|----------------------|
| Number of Mills.....   | 51        | 25        | 15        | 6               | 4                | 1                    |
| Pulp produced.....     |           |           |           |                 |                  |                      |
| Aggregate..... tons.   | 474,604   | 282,938   | 156,076   | 25,955          | 9,285            | 350                  |
| Mechanical..... "      | 370,195   | 235,889   | 108,351   | 25,955          |                  |                      |
| Sulphite..... "        | 95,987    | 40,681    | 47,271    |                 | 7,685            | 350                  |
| Soda..... "            | 8,422     | 6,368     | 454       |                 | 1,600            |                      |
| Wood used.....         |           |           |           |                 |                  |                      |
| Aggregate..... cords.  | 508,487   | 342,755   | 210,552   | 29,606          | 15,134           | 410                  |
| Aggregate cost..... \$ | 3,585,154 | 1,879,881 | 1,479,538 | 135,965         | 87,620           | 2,200                |
| Average cost..... \$   | 6.00      | 5.48      | 7.02      | 4.59            | 5.79             | 5.00                 |
| Spruce—.....           |           |           |           |                 |                  |                      |
| Total..... cords.      | 470,230   | 239,824   | 189,196   | 25,636          | 15,134           | 440                  |
| Total cost..... \$     | 2,846,678 | 1,310,428 | 1,326,275 | 120,155         | 87,620           | 2,200                |
| Average cost..... \$   | 6.05      | 5.47      | 7.01      | 4.68            | 5.79             | 5.00                 |
| Mechanical..... cords. | 323,350   | 188,905   | 108,809   | 25,636          |                  |                      |
| Sulphite..... "        | 134,959   | 80,387    | 41,998    |                 | 12,134           | 440                  |
| Soda..... "            | 11,921    | 8,921     |           |                 | 3,000            |                      |
| Balsam—.....           |           |           |           |                 |                  |                      |
| Total..... cords.      | 130,475   | 96,474    | 20,256    | 3,745           |                  |                      |
| Total cost..... \$     | 698,608   | 537,485   | 146,388   | 14,735          |                  |                      |
| Average cost..... \$   | 5.31      | 5.57      | 7.22      | 3.94            |                  |                      |
| Mechanical..... cords. | 64,377    | 52,848    | 6,784     | 3,745           |                  |                      |
| Sulphite..... "        | 56,098    | 42,626    | 13,472    |                 |                  |                      |
| Soda..... "            |           |           |           |                 |                  |                      |
| Hemlock.....           |           |           |           |                 |                  |                      |
| Total..... cords.      | 3,816     | 3,616     |           | 200             |                  |                      |
| Total cost..... \$     | 16,922    | 15,922    |           | 1,000           |                  |                      |
| Average cost..... \$   | 4.43      | 4.40      |           | 5.00            |                  |                      |
| Mechanical..... cords. | 600       | 400       |           | 200             |                  |                      |
| Sulphite..... "        |           |           |           |                 |                  |                      |
| Soda..... "            | 3,216     | 3,216     |           |                 |                  |                      |
| Poplar—.....           |           |           |           |                 |                  |                      |
| Total..... cords.      | 3,608     | 2,483     | 1,100     | 25              |                  |                      |
| Total cost..... \$     | 21,366    | 14,416    | 6,875     | 75              |                  |                      |
| Average cost..... \$   | 5.92      | 5.80      | 6.25      | 3.00            |                  |                      |
| Mechanical..... cords. | 25        |           |           | 25              |                  |                      |
| Sulphite..... "        | 1,800     | 1,800     |           |                 |                  |                      |
| Soda..... "            | 1,783     | 683       | 1,100     |                 |                  |                      |
| Others—.....           |           |           |           |                 |                  |                      |
| Total..... cords.      | 358       | 358       |           |                 |                  |                      |
| Total cost..... \$     | 1,580     | 1,580     |           |                 |                  |                      |
| Average cost..... \$   | 4.42      | 4.42      |           |                 |                  |                      |
| Mechanical..... cords. | 200       | 200       |           |                 |                  |                      |
| Sulphite..... "        |           |           |           |                 |                  |                      |
| Soda..... "            | 149       | 149       |           |                 |                  |                      |

The annual consumption of pulpwood per mill in Canada, during 1910, was 11,735 cords, as compared with a consumption of 12,442 cords per mill in 1909. The largest mills are those in Ontario, which used an average of 14,037 cords per mill. The average consumption per mill in Quebec was 13,710 cords; in Nova Scotia, 5,934 cords, and in New Brunswick, 3,783 cords.

## EXPORTS.

Canada's foreign trade in pulpwood and wood-pulp is growing greater. Unfortunately, the tendency is still to export wood in the raw form of pulpwood rather than in the manufactured form of wood-pulp. This is a direct loss to the country, for the increased value due to manufacture is given away. The data in the following tables refer to the calendar years, and have been furnished by the Department of Trade and Commerce.

In 1910, for the first time, \$49,000 worth of pulp was imported into Canada, four fifths of which was from the United States.

TABLE 5.

EXPORT OF WOOD-PULP, 1909 AND 1910 : Quantity, Value, Per Cent Distribution and Chief Countries Importing.

| Kind of Pulp and Countries to which Exported. | 1909.     |           |           | 1910.     |           |           |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
|   | Quantity. | Value.    | Per Cent. | Quantity. | Value.    | Per Cent. |
|   | Tons.     | \$        |           | Tons.     | \$        |           |
| Wood pulp exported aggregate.....             | 280,744   | 4,898,842 | 100       | 328,977   | 5,694,896 | 100       |
| Total mechanical pulp.....                    | 241,750   | 3,378,225 | 86.1      | 288,807   | 4,234,705 | 87.8      |
| Total chemical pulp.....                      | 38,994    | 1,520,617 | 13.9      | 40,170    | 1,460,191 | 12.2      |
| Mechanical pulp:—                             |           |           |           |           |           |           |
| To United States.....                         | 154,179   | 2,482,221 | 63.8      | 214,469   | 3,450,831 | 74.3      |
| To United Kingdom.....                        | 78,510    | 805,519   | 32.5      | 62,103    | 657,183   | 21.5      |
| To other countries.....                       | 9,061     | 90,485    | 3.7       | 12,235    | 126,691   | 4.2       |
| Chemical pulp:—                               |           |           |           |           |           |           |
| To United States.....                         | 37,336    | 1,450,340 | 95.7      | 39,947    | 1,451,068 | 99.5      |
| To United Kingdom.....                        | 1,049     | 42,007    | 2.7       | 178       | 7,398     | 0.4       |
| To other countries <sup>(1)</sup> .....       | 609       | 19,270    | 1.6       | 45        | 1,725     | 0.1       |

(<sup>1</sup>) Includes the following countries given in their order of importance:—France, Belgium, Mexico, Australia, Cuba and Japan.

Although pulpwood production was less in Canada during 1910 than during the year previous, exportations of wood-pulp were increased by 48,233 tons. Wood-pulp exportations amounted in 1910, to 69.3 per cent of the total amount produced in Canada, whereas in 1909 it was only 63 per cent. Of the 328,977 tons of wood-pulp exported, 288,807 tons, or 87.8 per cent, was mechanical pulp, which is a little greater percentage than in 1909. Only 78 per cent of the pulp manufactured in Canada was mechanically prepared. While the increase in export for 1910 consisted of mechanical pulp, 1,173 tons more of chemical pulp also were exported in 1910 than during 1909. The 40,170 tons of chemical pulp shipped made up 12.2 per cent of the total export.

The average value per ton of the pulp exported in 1909 was \$14.67 for the mechanical, and \$36.35 for the chemical pulp. This is an increase over the 1909 price of 70 cents for the mechanical, and a decrease of \$2.64 for the chemical pulp. The average

price for all pulpwood exported was \$17.31, or 14 cents less per ton than the previous year's price. The prices per ton paid to Canadian exporters by the different importing countries were as follows for mechanical pulp: United States, \$16.00 (exactly the same as in 1909); United Kingdom, \$15.78 (\$5.52 more than in 1909); other countries, \$10.35 (37 cents more than in 1909). For chemical pulp: United States, \$36.32; United Kingdom, \$41.60; other countries, \$38.30.

During 1910, over three quarters of the wood-pulp exported went to the United States. This country took 74.3 per cent of the mechanical pulp and over 99 per cent of the chemical pulp exported from Canada in 1910. Except for an increase of 3,000 tons of mechanical pulp to small transatlantic countries, export to other countries decreased. The export of chemical pulp to the United Kingdom has fallen off from 7,519 tons in 1908, to 178 tons (not one fortieth as much) in 1910. The mechanical pulp shipped to the British Isles also decreased by 16,407 tons during 1910. The United Kingdom received in 1909, 32.5 per cent of the mechanical pulp exported from Canada, while in 1910, only 21.5 per cent of the amount exported was used in those countries.

The export of pulpwood in a raw state is increasing yearly, and by just so much as this is the case does Canada lose the benefits to be derived from its manufacture and the increased value of raw products. All raw pulpwood is exported to the United States.

In Table 6 a detailed statement is given of the quantities of pulpwood manufactured in Canada and exported raw.

TABLE 6.

CANADIAN PULPWOOD EXPORTED UNMANUFACTURED VS. THAT MANUFACTURED IN CANADA, 1909 AND 1910: Quantity, Value and Per Cent Distribution.

|                                  | 1909.     |           |           | 1910.     |           |           |
|----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                  | Quantity. | Value.    | Per Cent. | Quantity. | Value.    | Per Cent. |
|                                  | Cords.    | \$        |           | Cords.    | \$        |           |
| Pulpwood produced in Canada..... | 1,537,762 | 9,216,739 | 100       | 1,541,628 | 9,795,196 | 100       |
| Manufactured in Canada.....      | 622,129   | 3,464,080 | 40.5      | 598,487   | 3,585,154 | 38.8      |
| Exported in raw state.....       | 915,633   | 5,752,659 | 59.5      | 943,141   | 6,210,042 | 61.2      |

In 1910, only some 4,000 cords more wood were cut for pulp in Canada than in 1909. Of the 1910 amount of 1,541,628 cords, 23,642 cords less were manufactured in Canada than in 1909, and 27,508 cords more were exported. This gradual change is not so noticeable in the comparative percentages, but even here it may be seen that Canada is increasing the proportion of her natural resources exported in the raw state.

Over 60 per cent of the pulpwood cut in Canada during 1910 was sent out of the country without further labour being expended on it. The United States manufactured it into pulp and paper. The amount paid for this wood was \$6,210,042, or an average of \$6.58 per cord. As the average paid by Canadian mills was \$6, this is an average of 58 cents per cord more paid for exported pulpwood at the point of shipment.

From United States Forest Products Bulletins it is seen that approximately two fifths of the pulpwood imported by that country is manufactured into mechanical pulp, and three fifths into sulphite pulp, and that a cord of wood produces about

one ton of mechanical pulp, or half a ton of chemical pulp. This means that from the 943,141 cords of Canadian pulpwood sent to the United States, 377,256 tons of mechanical pulp were made, and 282,992 tons of sulphite pulp. The value of these 660,248 tons of pulp, for which, in the form of pulpwood, Canada received \$6,210,042, was, at the average price (\$20.49 per ton) paid in 1910 by United States importers of wood-pulp, \$13,528,481. Thus Canada did not get one-half the amount she would have received if all pulpwood were converted into pulp on Canadian soil. As the United States does not export 2 per cent of the amount it imports, there need be no fear that a market for Canadian wood-pulp would be lacking. The United States would pay \$20.49 per ton for the wood-pulp instead of \$6.58 per cord of pulpwood.

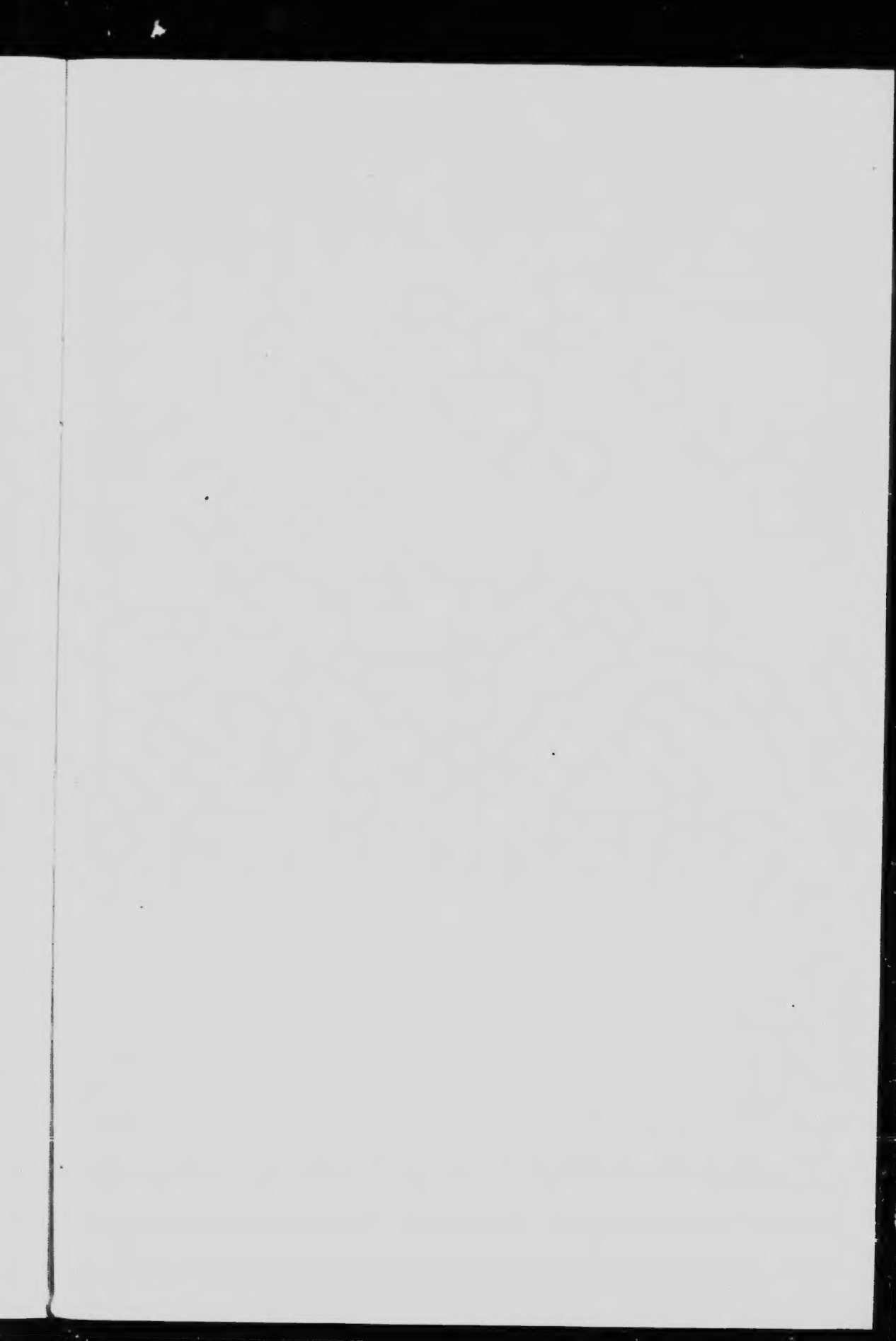
As the 1910 report of the United States pulpwood consumption has not been issued, comparisons cannot be made between the two countries for 1910. In 1909, however, the pulpwood shipped from Canada, consisting of spruce and poplar logs, furnished 22.8 per cent of the entire pulpwood consumption of the United States. This means that 58 of the 253 pulp mills of the United States ran for the year, employed help and paid profits on raw products furnished by Canada. The three most important pulpwood states of the union benefited from Canada's resources as follows: New York state drew nearly one-half, or 48 per cent, of its pulpwood from Canadian forests; 18 per cent of Maine's consumption was Canadian logs, and 80 per cent of the pulpwood used in New Hampshire came from Canada.

If the pulpwood exported in 1910 had been reduced to pulp in Canada, it would have supplied 80 mills of the average size of those in Canada. Thus 131 mills instead of 51 would have been operating in Canada, would have been employing labor, and advancing Canadian industry.

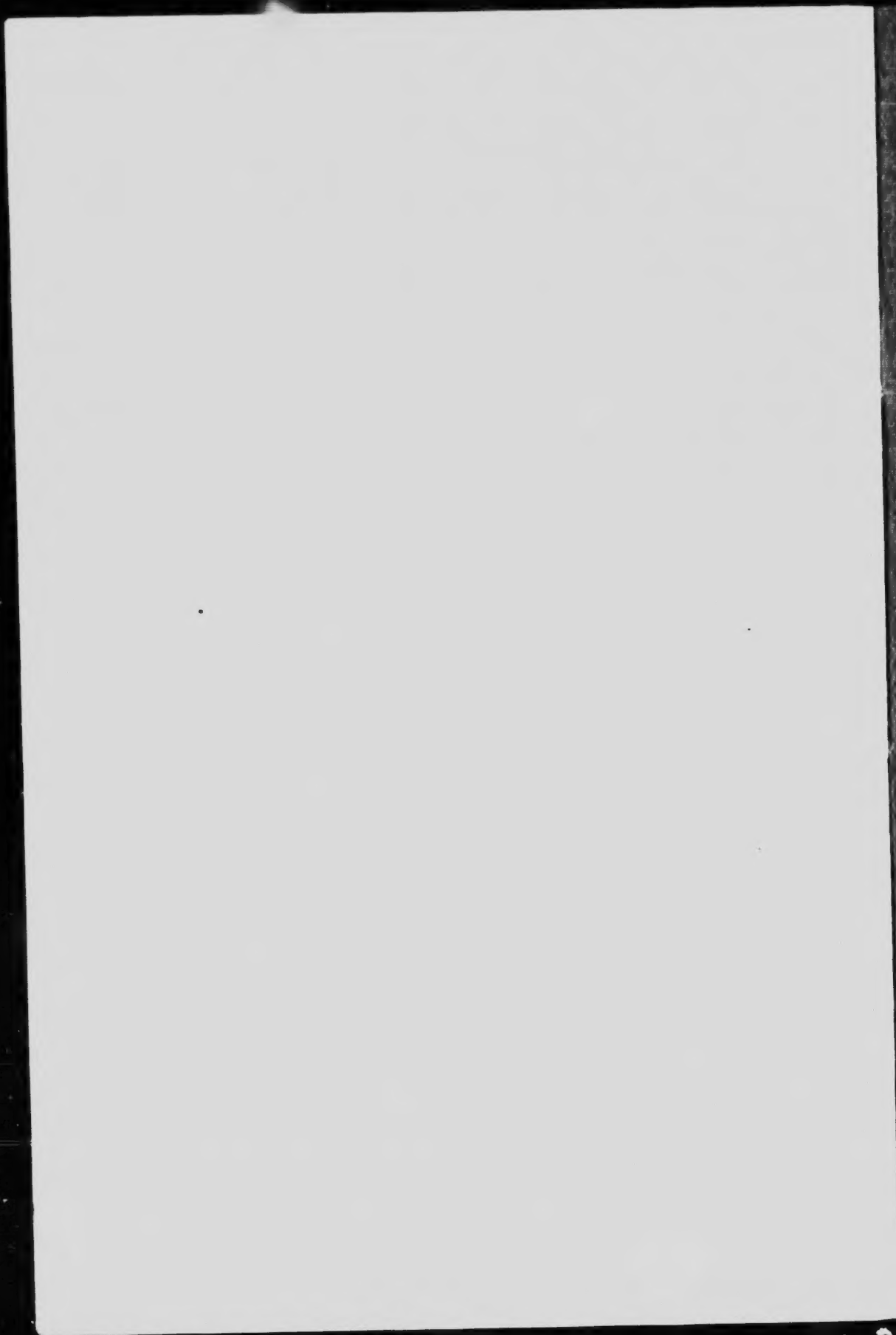
The provincial laws affecting the export of pulpwood within the exporting provinces have changed considerably in 1910. In 1909, pulpwood from private lands in Ontario and from all lands in Quebec and New Brunswick could be shipped to points outside of Canada. In 1910, the province of Quebec issued more restrictive regulations, the effect of which was to permit exportation of unmanufactured wood cut only on private lands within the province, and in 1911, New Brunswick passed legislation to the same effect. These regulations, however, did not affect the 1910 export trade, as they came into force later. Authoritative information supplied by the Department of Customs leads to the statement that the total pulpwood export was cut from the various provinces in the following amounts and values: 779,000 cords, worth \$5,090,000, from the timber limits of Quebec; 90,000 cords, worth \$647,000, from New Brunswick, and 74,000 cords, worth \$473,000, from Ontario.

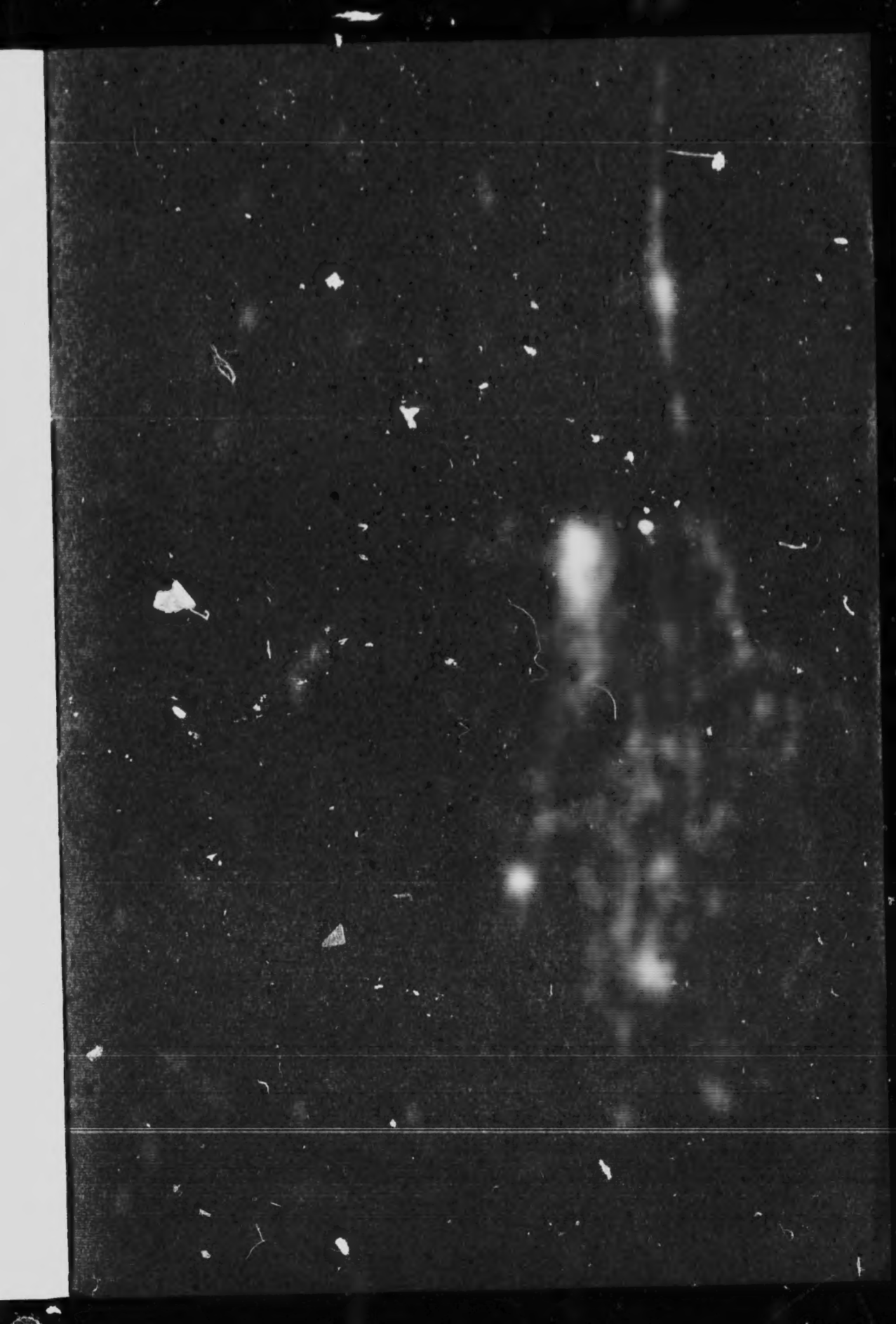
It is interesting to note to what extent provincial industry would have been increased if the pulpwood exported to the United States had been converted into wood-pulp on Canadian soil.

The 779,000 cords exported from Quebec would have supplied material for a year to fifty six pulp mills of the average size operating in Quebec. In Ontario, five mills of the average size could have been kept running with the pulp logs exported from this province. The 90,000 cords shipped from the ports of New Brunswick would have produced the most startling results, if the amount had been manufactured into pulp within that province. The amount exported was sufficient to supply with wood twenty four mills of the average size, with the result that five times the actual number of mills operating would have been at work if Canadians had been far-seeing enough to manufacture their own raw products.









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